

Broadband power line communications, currently designated “BPL” should not be authorized.

I am a registered professional electrical engineer, a graduate of Purdue (1968), and have been and currently am responsible for the maintenance of two-way radios used for “co-ordination” of South Central Indiana REMC which dispatches at a frequency of 47.9 mHz. I was formerly a project engineer with the broadcast division of Sarkes Tarzian Inc. designing broadcast equipment. I received my first FCC license in 1962 when I was in high school (it was an amateur license).

RF spectrum is a valuable resource and it has primary value in communication with mobiles. The proposed use of a 1700khz to 80 mhz signal sent over power lines has the unfortunate consequence of adding noise to the radio spectrum. The noise effect will be larger the closer the receiver’s antenna is to the power line that carries the BPL signaling.

In rural areas, power lines were typically granted easements that followed the roads and right of ways. This means that distribution power lines will typically follow roads and streets.

In rural areas, unlike urban areas, the low band frequencies (30-50 MHZ) were originally used for dispatch of utilities and public safety services. This was because the propagation on these frequencies, as well as larger antenna size, gave much better radio coverage (2-3X) than the VHF or UHF bands. In addition, many of the original low band utility frequencies were co-ordinated to allow direct radio communication with the National Guard in times of emergency.

There is no magic in BPL signaling. Power line signaling systems are well documented in the original Collins “Kineplex” patents which were issued in the 1940's. The use of the power line for delivery of information has been an inventor’s dream since the 1920's . Since then the concept of power line signaling has absorbed millions of dollars in speculative capital.

The physics of the power line communications results in the BPL signal radiating from the power lines. There is no way to eliminate the loss to electromagnetic radiation excepting thick dielectric cladding (Gombau effect) or a coaxial shield. AC current is a component of an electromagnetic field. Stated in different form: In order to send the signal over the power line, it is necessary to create a changing current, thus using BPL signaling will create a radiated electromagnetic field which is a “fancy” name for a radio wave.

Since the power line is co-located with the roadway, the authorization of BPL will effectively require the replacement of all existing mobile radio services, which are the utilities, fire and police, operating below 80 mHz. This is ignoring the fact that BPL signaling will also disturb all the television channels below channel 5.

In addition, depending on the radiated power and propagation conditions, the radiated BPL signal will pass beyond the borders of the United States. Thus the question of potential violation of international treaties must be visited. For example, a 0.1 watt signal has been used to communicate between the United States and Australia on 28 mHz. While it is a record for low power communications, the proposed BPL signals will be much higher in level than the tenth of a watt record.

Since the power companies own the easements, it would appear that by simply adding a 6 strand bundle of fiber to their poles or towers, they could achieve broader bandwidth to customer connections without polluting irreplaceable spectrum. A single glass fiber can carry 10,000 times the channel capacity of a power line and thus preserve the electromagnetic spectrum for mobile applications that cannot be mechanically connected.

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